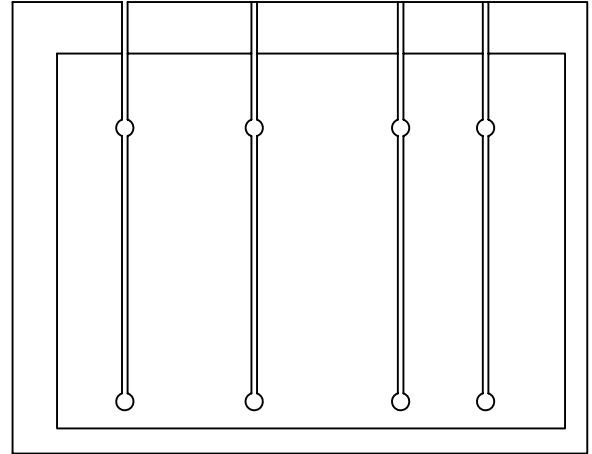


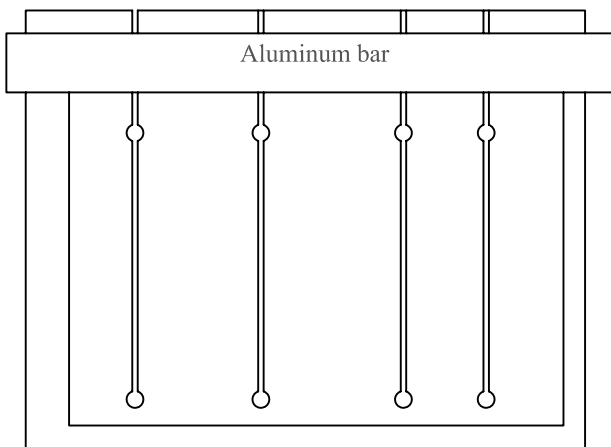
①



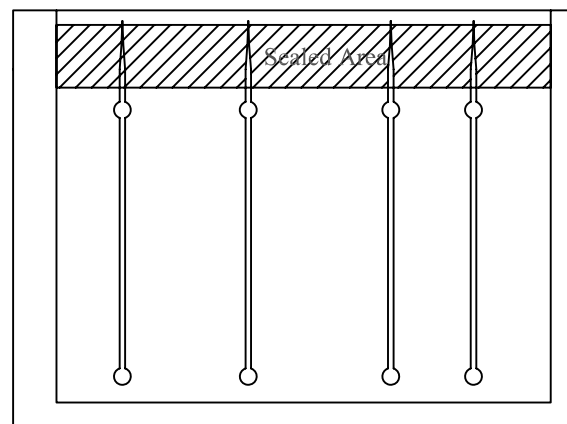
②

1- Chips are embossed with the wires inside resulting in a very sturdy chip. The wires are pulled out using pliers after fixing the chip using a vise

2- Wells are drilled carefully to penetrate only the cover. and 4cm from the bottom wells the top wells are drilled as well. now the channel is still open and not sealed from the upper edge.



③

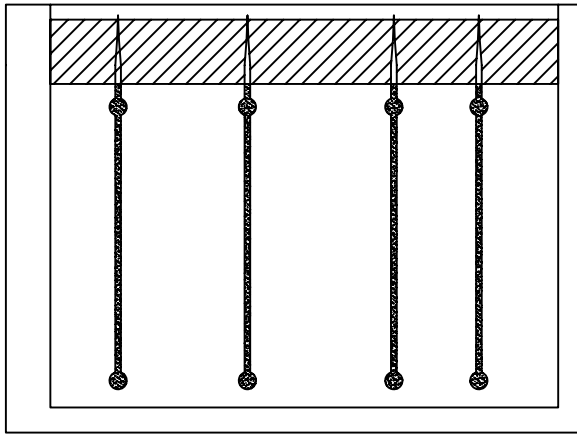


④

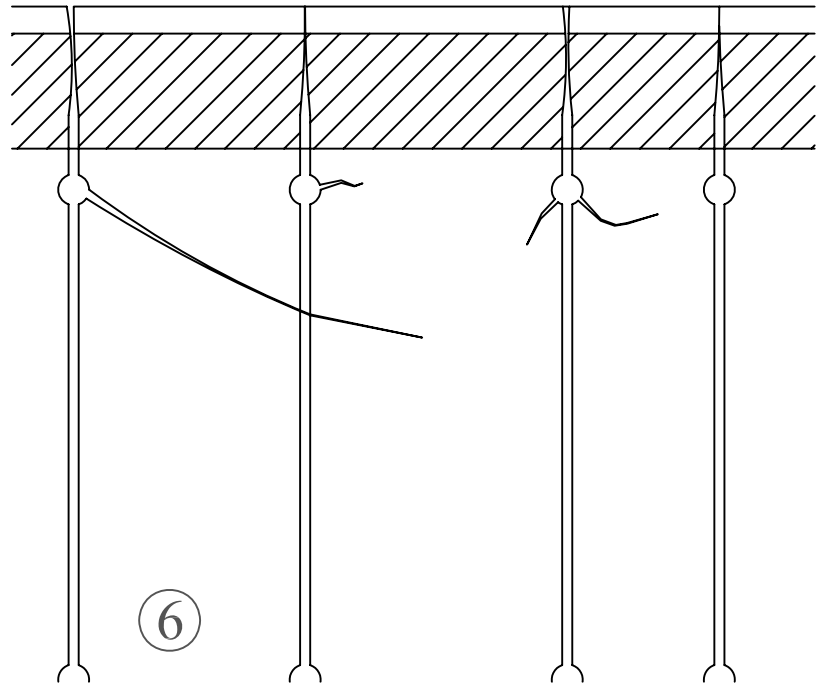
3-Using an aluminum bar the chip is sealed from the top leaving enough space to stick the ports

4-The sealing results in complete deformation and closing of the part of the channel beneath the aluminum and no solution could reach that part beyond the well lack of ventilation.

## Problem report 8-9-08



5



6

5-Filling up the channel with grafting solution in particular and irradiating it would result in the fracture patterns seen in figure -6- strictly around the sealed side of chip and the corresponding wells.

\* This has happened for two batches of chips each with 15 then 10 chips a batch. For the first one the yield was 50% for the second batch all channels were affected one way or another and the entire batch was lost.

\*The sealed band on the top would stiffen up and crack exposing the channel that was once sealed.

\*To investigate further a raw sealed chip with no grafting solution was irradiated for a prolonged period of time. nothing happened at all. the chip remained intact.

\*adding the grafting solution to the chip and irradiating it resulting in fractures and loss of the chip.

\*The chip might come out sometimes looking good and intact but would suddenly fracture after 10 minutes sitting on the bench.

\*Not even covering the sealed area completely from both sides with tape would prevent it from cracking

\*Thinking that overflowing the channels with the grafting solution contributed to this fracture around the wells ,only channel volume of the G solution was pumped in. results were somewhat worst, or perhaps independent.

\*My preliminary conclusion is that the "stretched "plastic at the sealing site is somehow getting affected by the energy and the grafting solution is playing a major role in facilitating this causing the plastic to rebound breaking the material

\*These cracks are through the whole depth of the chip not merely base or cover, and they propagate cutting the chip in half.

\*Solving this problem is technically easy and is achieved by leaving the sealing to be the very last step. It is very easy to fill the channels and pump in the monolith and SPE even if the channel is open at the end.

\* This was reported in my notebook as a problem before we started using the silicon rubber and it used to happen frequently. But the silicon rubber , or perhaps ceasing to use metal wires contributed to the disappearance of this phenomenon. Now it shows again.

As i said its completely avoidable but could someone shed light on the subject if this had been encountered ever before? or if someone can provide a hypothesis for what is happening ?